UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/839,581	04/20/2001	Fred Allegrezza	BPCUR0001FA (C-1)	1423

27939 7590 07/30/2009
PHILIP H. BURRUS, IV
460 Grant Street
Atlanta, GA 30312

EXAMINER	
PARRY, CHRISTOPHER L	

ART UNIT	PAPER NUMBER
2421	

MAIL DATE	DELIVERY MODE
07/30/2009	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

UNITED STATES PATENT AND TRADEMARK OFFICE

Commissioner for Patents
United States Patent and Trademark Office
P.O. Box 1450
Alexandria, VA 22313-1450
www.uspto.gov

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Application Number: 09/839,581
Filing Date: April 20, 2001
Appellant(s): ALLEGREZZA, FRED

Mr. Philip H. Burrus, IV
For Appellant

EXAMINER'S ANSWER

This is in response to the appeal brief filed 11 May 2009 appealing from the Office action mailed 29 August 2008.

(1) Real Party in Interest

A statement identifying by name the real party in interest is contained in the brief.

(2) Related Appeals and Interferences

The examiner is not aware of any related appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in the pending appeal.

(3) Status of Claims

The statement of the status of claims contained in the brief is incorrect. A correct statement of the status of the claims is as follows:

Claims 1, 2, 4-7, 9-14, 16-19, 21-24, 53 and 54 are pending in the application. Claims 53 and 54 are withdrawn from consideration as not directed to the elected invention.

This appeal involves claims 1, 2, 4-7, 9-14, 16-9, and 21-24.

Claims 53 and 54 are withdrawn from consideration as not directed to the elected invention.

(4) Status of Amendments After Final

The appellant's statement of the status of amendments after final rejection contained in the brief is correct.

(5) Summary of Claimed Subject Matter

The summary of claimed subject matter contained in the brief is correct.

(6) Grounds of Rejection to be Reviewed on Appeal

The appellant's statement of the grounds of rejection to be reviewed on appeal is correct.

(7) Claims Appendix

The copy of the appealed claims contained in the Appendix to the brief is correct.

(8) Evidence Relied Upon

6,128,467	Rege	10-2000
5,586,264	Belknap et al.	12-1996

(9) Grounds of Rejection

The following ground(s) of rejection are applicable to the appealed claims:

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. Claims 1-2, 4-7, 9-14, 16-19, and 21-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over Rege (USPN 6,128,467) [cited by applicant on July 16, 2007] in view of Belknap et al. "Belknap" (USPN 5,586,264).

Regarding Claim 1, Rege discloses a system (200 – figure 2) for retrieving data distributed across a plurality of storage devices (800 – figure 2) (Col. 3, lines 18-27), the system comprising: a plurality of processors (300 – figure 2), wherein upon receipt of a request for retrieving data, a processor is designated for handling the request (Col. 3, lines 28-63, Col. 5, lines 64-67).

Rege further discloses a switch (400 – figure 2) arranged between the processors (300 – figure 2) and the storage devices (800 – figure 2), wherein the switch independently routes a request for retrieving data from the designated processor directly to the storage devices containing the requested data and independently routes responses from the storage devices directly to the designated processor and wherein the data comprises video stream data (figures 4 & 5; Col. 3, lines 19-35; Col. 3, line 64 to Col. 4, line 39; Col. 4, lines 56-67).

Rege teaches servers 300 generate data request packets that are sent to disks 800 when a request from a customer is received. The request includes a header, disk address field, size field, server memory address field, and error correction field. The disk address is the logical address of the portion of the selected multimedia to be transferred to the server 300 from disk 800 (Col. 6, lines 6-46). However, Rege is silent on disclosing wherein the switch independently routes a request for retrieving data from the designated processor directly to the storage devices containing the requested data

based on directory information obtained by the processor, and independently routes responses from the storage devices directly to the designated processor based on the directory information obtained by the processor, and wherein the data comprises video stream data.

In an analogous art, Belknap discloses a system (10 – figure 1) for retrieving data distributed across a plurality of storage devices (16 – figure 2) (Col. 6, lines 22-52), the system comprising: a switch (12 – figure 1), wherein the switch routes a request for retrieving data from the designated processor directly to the storage devices containing the requested data based on directory information (i.e., RAID mapping for data stored on disks 45) obtained by the processor, and routes responses from the storage devices directly to the designated processor based on the directory information obtained by the processor (Col. 7, lines 4-7 & lines 53-67; Col. 8, lines 41-53; Col. 9, lines 8-31). Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the system of Rege to include retrieving data from the designated processor directly to the storage devices containing the requested data based on directory information obtained by the processor, and independently routes responses from the storage devices directly to the designated processor based on the directory information obtained by the processor as taught by Belknap for the benefit of providing an improved data retrieval system that can provide video data to customers in a more immediate fashion.

As for Claims 2 and 14, Rege and Belknap disclose, in particular Rege teaches a resource manager (600 – figure 2) for designating a processor (300 – figure 2) to handle a request, based on the load on each processor (Col. 4, lines 41-67; Col. 5, lines 59-63; Col. 6, lines 39-46).

As for Claims 4 and 16, Rege and Belknap disclose, in particular Belknap teaches wherein the processor obtains the directory information (i.e., RAID mapping for data stored on disks 45) from the storage devices (Col. 7, lines 64-67; Col. 9, lines 8-31).

As for Claims 5 and 17, Rege and Belknap disclose, in particular Rege teaches the system of claim 1, further comprising at least one high speed network (i.e., LAN 210 – figure 2) connected to the storage devices and arranged between the switch and the storage devices (Col. 3, lines 18-37).

As for Claims 6 and 18, Rege and Belknap disclose, in particular Rege teaches wherein the switch accommodates a plurality of high speed networks (i.e., LAN 210 – figure 2) and connected storage devices (Col. 3, lines 28-40).

As for Claims 7 and 19, Rege and Belknap disclose, in particular Rege teaches wherein the high speed network is an Ethernet network (Col. 4, lines 56-67).

As for Claims 9 and 21, Rege and Belknap disclose, in particular Rege teaches wherein the storage devices are disk drives (Col. 5, lines 19-44).

As for Claims 10 and 22, Rege and Belknap disclose, in particular Rege teaches wherein the data is stored in a Redundant Array of Inexpensive Disks (RAID) format among the disk drives (Col. 5, lines 36-63).

As for Claims 11 and 23, Rege and Belknap disclose, in particular Belknap teaches the system of claim 1, further comprising a high speed network for delivering the retrieved data from the designated processor to a client device (Col. 12, lines 50-53).

As for Claims 12 and 24, Rege and Belknap disclose, in particular Belknap teaches wherein the high speed network is an Asynchronous Transfer Mode (ATM) network (Col. 12, lines 50-53).

Regarding Claim 13, Rege discloses a method for retrieving data distributed across a plurality of storage devices (Col. 3, lines 29-42), the method comprising the steps of: receiving a request for retrieving data (Col. 3, lines 29-31), wherein the data comprises video stream data (Col. 3, lines 18-33).

Rege further discloses designating a processor (300 – figure 2) for handling the request (Col. 4, lines 41-67; Col. 5, lines 59-63; Col. 6, lines 39-46).

Rege teaches returning responses from the storage devices (800 - figure 2) directly to the designated processor via the switch (400 - figure 2) (Col. 3, lines 33-35), wherein the switch independently route the request for retrieving data and the responses between the storage devices and the processor (figures 4 & 5; Col. 3, lines 19-35; Col. 3, line 64 to Col. 4, line 39; Col. 4, lines 56-67).

Rege is silent on disclosing forwarding the request directly from the designated processor to the storage devices containing the data via a switch and disclosing wherein the switch uses directory information obtained by the processor to route requests.

In an analogous art, Belknap discloses a method for retrieving data distributed across a plurality of storage devices (Col. 17, lines 28-65), the method comprising the steps of: receiving a request for retrieving data, wherein the data comprises video stream data (Col. 8, lines 32-35).

Belknap discloses forwarding the request directly from the designated processor (14 – figure 1 & 1D) to the storage devices (16 – figure 1 & 1C) containing the data via a switch (12 – figure 1 & 1A) (Col. 8, lines 40-52; Col. 9, lines 8-19; Col. 12, lines 57-62)

Belknap teaches returning responses from the storage devices directly to the designated processor via the switch (Col. 12, lines 57-59), wherein the switch uses directory information (i.e., RAID mapping for data stored on disks 45) obtained by the processor to route the request for retrieving data and the responses between the storage devices and the processor (Col. 7, lines 4-7 & lines 53-67; Col. 8, lines 41-53; Col. 9, lines 8-31). Therefore, it would have been obvious to one of ordinary skill in the

art at the time the invention was made to modify the system of Rege to include retrieving data from the designated processor directly to the storage devices containing the requested data based on directory information obtained by the processor, and independently routes responses from the storage devices directly to the designated processor based on the directory information obtained by the processor as taught by Belknap for the benefit of providing an improved data retrieval system that can provide video data to customers in a more immediate fashion.

(10) Response to Argument

1. Examiner's response to Appellant's argument that "No Prima Facie Case of Obviousness has been made"

In response to appellant's argument (see page 15 of appellant's brief) that the examiner's conclusion of obviousness is based upon improper hindsight reasoning, it must be recognized that any judgment on obviousness is in a sense necessarily a reconstruction based upon hindsight reasoning. But so long as it takes into account only knowledge which was within the level of ordinary skill at the time the claimed invention was made, and does not include knowledge gleaned only from the appellant's disclosure, such a reconstruction is proper. See *In re McLaughlin*, 443 F.2d 1392, 170 USPQ 209 (CCPA 1971).

Further in response to appellant's argument (see page 15 of appellant's brief) that there is no suggestion to combine the references, the examiner recognizes that obviousness can only be established by combining or modifying the teachings of the

prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art. See *In re Fine*, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988) and *In re Jones*, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992). In this case, Belknap provides a hierarchical solution to different performance requirements and results in a modular system that can be customized to meet market requirements (Belknap; Col. 2, lines 42-48). Furthermore, one of ordinary skill in the art would have knowledge that a directory which stores data related to the availability of content and the location of the content would be beneficial to any system that distributes content, as the directory would facilitate minimizing the processing required by the processor to locate all instances of requested content.

2. Examiner’s Response to Appellant’s Additional Arguments

In response to appellant’s argument regarding Claim 1 (Page 19, 1st full ¶) stating that connecting disks to servers in response to, and based upon, switching requests having destination address information embedded therein expressly teaches away from Appellant's invention of independently routing requests and responses based upon directory information obtained by the processor, the examiner respectfully disagrees.

The Examiner would like to first point to Appellant's specification which defines how the claimed switch “independently” routes a request from a processor to a disk storage device. Appellant's specification on Page 3, line 24 to Page 4, line 6 states the following:

According to an exemplary embodiment, multiple storage area networks 200 can be joined using a Storage Area Network (SAN) 250, thus efficiently expanding the video storage network. The SAN switch 250 allows multiple CPUs to access multiple common storage devices, e.g., disk arrays 100. The SAN switch 250 is a self-learning switch that does not require workstation configuration. The SAN switch 250 routes data independently, <u>using addresses provided by the designated CPU</u>, based on the directory information.

The SAN switch 250 allows multiple storage area networks to be joined together, allowing each network to run at full speed. The SAN switch 250 routes or switches data between the networks, <u>based on the addresses provided by the designated CPU</u>.

Further, Appellant's specification on Page 5, line 19 to Page 6, line 2 states the following:

When a video stream is requested by a client device 600, a CPU is designated to handle the request by the resource manager 350. The designated CPU has access to all of the disk drives and reads the directory information from the disk drives to identify where blocks of data are stored on the disk drives. The request is delivered to the CPU 300, and the CPU 300 sends the request for data, including the storage device address and the blocks of data to be read. The request message also includes the source CPU device address. The SAN switch 250 then independently routes the block read command to the designated storage device <u>using the device address</u>. The disk storage device 100 accesses

the data internally and then returns the data blocks in one or more responses addressed to the original requesting CPU device address, formatted for the delivery network. The SAN switch 250 then independently routes the data block response to the designated CPU 300 using the device address.

Thus the specification clearly discloses the claimed switch receives a request from CPU 300 and reads the device address contained in the request to facilitate “independently” routing the block read command to the designated storage device.

Rege discloses a multimedia delivery system 200 that comprises a plurality of servers 300 (i.e., CPU 300 or “plurality of processors”) connected by a crosspoint switch 400 (i.e., switch 250 or “a switch”), switch 400 includes request arbiter 600, and a plurality of disk storage systems 800 (i.e., disk array 100 or “plurality of storage devices”) (fig. 2; Col. 3, lines 18-27).

Rege further discloses during operation of the system 200, demands for selected multimedia items are received from customers via the network 160. The servers 300, in response to the demands, generate data requests for the selected items (Col. 3, lines 29-32). FIG. 10 of Rege shows a data request packet 1000 generated to initiate a transfer of content from one of the disk systems 800 to one of the servers 300. The multimedia request packet 1000 includes a header (HDR) 1010, a disk address field 1020, a size field 1030, a server memory address field 1040, and an error correction field (CRC) 1050. In response to customer demands, for example a demand for a selected movie, the "destination" server 300 for content generates appropriate data request packets 1000. The packets are “independently” routed to the destination via the

switch 400 (Col. 6, lines 6-30). The storage systems transfer the items to the servers 300 via the switch 400. The operation of the switch 400 is controlled by the arbiter 600. The arbiter 600 can receive switching requests via the LAN 210 from both the servers 300 and the disk systems 800. The arbiter 600 ensures that the selected items are appropriately routed between the servers 300 and the disk systems 800 (Col. 3, lines 32-40).

Appellant repeatedly states in the brief that Rege teaches away from Appellant's invention because switch 400 routes data between servers 300 and the disk systems 800 using the switching request received from "destination" sever 300. The Examiner would like to point to the Appellant's specification again which clearly states that the claimed switch 250 uses the device address contained within the request for data received from CPU 300 to facilitate "independently" routing the request message to the disk storage device (Page 5 lines 22-26).

Therefore, Rege discloses *a switch* (400 – figure 2) *arranged between the processors* (300 – figure 2) *and the storage devices* (800 – figure 2), *wherein the switch independently routes a request for retrieving data from the designated processor directly to the storage devices containing the requested data and independently routes responses from the storage devices directly to the designated processor and wherein the data comprises video stream data* (figures 4 & 5; Col. 3, lines 19-35; Col. 3, line 64 to Col. 4, line 39; Col. 4, lines 56-67).

The examiner maintains that Rege discloses a switch that independently routes a request for retrieving data from the designated processor directly to the storage devices containing the requested data.

In response to Appellant's argument regarding Claim 1 (starting on Page 21, 1st full ¶ and ending on Page 24) stating there is no teaching of independently routing requests based on directory information obtained by the processor, the examiner respectfully disagrees.

Rege discloses each data request packet 1000 generated by servers 300 includes a header (HDR) 1010, a disk address field 1020, a size field 1030, a server memory address field 1040, and an error correction field (CRC) 1050 (Col. 6, lines 6-12). As admitted by the Examiner in the Final Office Action mailed on 29 August 2008, Rege is silent on disclosing how servers 300 obtain the data for each request packet 100 and thus fails to disclose generating requests based on directory information obtained from the storage devices.

The Examiner relies upon the teachings of Belknap to teach storing a directory within a plurality of storage devices.

Belknap discloses a video optimized stream server system 10 in figure 1 comprising a low latency switch 12, communications nodes 14, storage nodes 16, and control node 18. Belknap discloses information is transferred through switch 12 in packets. Each packet contains a header portion that controls the switching state of individual crossbar switch points and control node 18 provides storage nodes 16 and

communication nodes 14 with the information necessary to enable communication via the low latency switch 12 (Col. 7, lines 4-10).

Belknap further discloses a disk storage node 16 further has an internal PC 44 which includes software modules 46 and 48 which, respectively, provide storage node control, video file and disk control, and RAID mapping for data stored on disks 45. In essence, each disk storage node 16 provides a more immediate level of video data availability than a tape storage node 17 (Col. 7, line 64 to Col. 8, line 3). When commands are issued over the control interface to start the streaming of data to an end user, control node 18 selects and activates an appropriate communication node 14 and passes control information indicating to it the location of the data file segments on the storage nodes 16, 17. The communications node 14 activates the storage nodes 16, 17 that need to be involved and proceeds to communicate with these nodes, via command packets sent through the low latency switch 12, to begin the movement of data (Col. 9, lines 8-15).

The Examiner points to the Appellant's specification which states that the claimed switch 250 uses the device address contained within the request for data received from CPU 300 to facilitate "independent" routing of the request message to the disk storage device (Page 5 lines 22-26).

Appellant repeatedly states Belknap fails to teach a switch that independently routes requests for retrieving data from the designated processor directly to the storage devices containing the requested data. Examiner points to Col. 7, lines 4-10 of Belknap where Belknap discloses a switch (12 - fig. 2) that independently routes requests for

retrieving data from the designated processor (i.e., nodes 18 and 14) directly to the storage devices (i.e., nodes 16) containing the requested data by utilizing the header portion of each packet to determine the destination of the request packet.

The examiner maintains that Belknap discloses a switch that independently routes a request for retrieving data from the designated processor directly to the storage devices containing the requested data.

In response to Appellant's argument regarding Claim 1 (Page 25, 2nd full ¶) stating Belknap fails to remedy the deficiencies of Rege, in particular the teaching of independently routing requests and responses based upon directory information obtained by the processor, the examiner respectfully disagrees.

Belknap discloses the use of a directory as Belknap teaches each disk storage node 16 provides RAID mapping for data stored on disks 45 within each node and that each disk storage node provides a more immediate level of video data availability (Col. 7, line 64 to Col. 8, line 3). Further Belknap discloses control node 18 further controls the operation of disk storage nodes 16 via commands sent through low latency switch 12 (Col. 8, lines 49-52). Control node 18 and communication node 14 (i.e., claimed processors) generate command packets to be sent to storage node 16 (i.e., claimed storage devices) via switch 12 (Col. 9, lines 8-16). As previously stated switch 12 reads the header of each command packet to determine the desired destination and routes the packet to the desired storage device (Col. 7, lines 4-10). Belknap discloses control node 18 and communication node 14 (i.e., claimed "processors") have access to and

control the operations of storage nodes 16 and storage nodes 16 comprise RAID mapping or “directory information” for data stored on disks 45. Further, using the RAID mapping data or “directory information” stored on storage nodes 16, communication node 14 activates the storage nodes 16 that need to be involved and moves data between the storage nodes 16 and communication node 14 via low latency switch 12 (Col. 9, lines 8-31).

Therefore, Belknap discloses a switch (12 – figure 1), wherein the switch routes a request for retrieving data from the designated processor (i.e., control node 18 and communication node 18) directly to the storage devices (i.e., storage nodes 16) containing the requested data based on directory information (i.e., RAID mapping for data stored on disks 45 stored on storage nodes 16) obtained by the processor [18/14], and routes responses from the storage devices [16] directly to the designated processor [18/14] based on the directory information obtained by the processor [18/14] (Col. 7, lines 4-7 & lines 53-67; Col. 8, lines 41-53; Col. 9, lines 8-31).

The examiner maintains that Belknap cures the deficiencies of Rege by disclosing RAID mapping or “directory information” obtained by the processors to facilitate routing requests for data.

In response to Appellant’s argument (Page 25, last ¶) stating the references themselves cannot be modified to obtain Appellant's invention, as that modification would change the principle operation of the Rege reference, the examiner respectfully disagrees.

Rege fails to disclose servers 300 accessing a directory to obtain information for generating request messages. Rege discloses servers 300 generate data request packet 1000 which includes a header (HDR) 1010, a disk address field 1020, a size field 1030, a server memory address field 1040, and an error correction field (CRC) 1050 but Rege is silent as to how servers 300 obtain the necessary data to generate the request packet 1000.

By adding the RAID mapping or “directory information” as disclosed by Belknap to Rege provides Rege with the ability to quickly locate where requested content is stored as opposed to searching each disk for the requested content. Servers 300 could then use the data obtained from RAID mapping to generate each request packet and the switch would operate the same by reading the address from the packet and routing the packet accordingly. Therefore, adding RAID mapping or "directory information" to Rege would not change the principle operation of the switch as disclosed by Rege.

In response to Appellant’s argument (Page 27, 1st ¶) stating Rege teaches dependent switching, the examiner respectfully disagrees.

As referenced above, Appellant’s specification defines independent routing to be using addresses provided by the designated CPU. Rege discloses switch 400 uses the addresses provided by servers 300 in order to forward the request to storage systems 800.

In response to Appellant's argument (Page 27, last ¶) stating Belknap fails to teach independent switch, the examiner respectfully disagrees.

As referenced above, Appellant's specification defines independent routing to be using addresses provided by the designated CPU. Belknap discloses switch 12 uses the addresses provided by the communications node 14 in order to forward the request to storage node 16.

(11) Related Proceeding(s) Appendix

No decision rendered by a court or the Board is identified by the examiner in the Related Appeals and Interferences section of this examiner's answer.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

/CHRIS PARRY/

Examiner, Art Unit 2421

Conferees:

/John W. Miller/

Supervisory Patent Examiner, Art Unit 2421

/Christopher Kelley/

Supervisory Patent Examiner, Art Unit 2424